



Creating LCA standard system for electrical and electronic products by using PCR

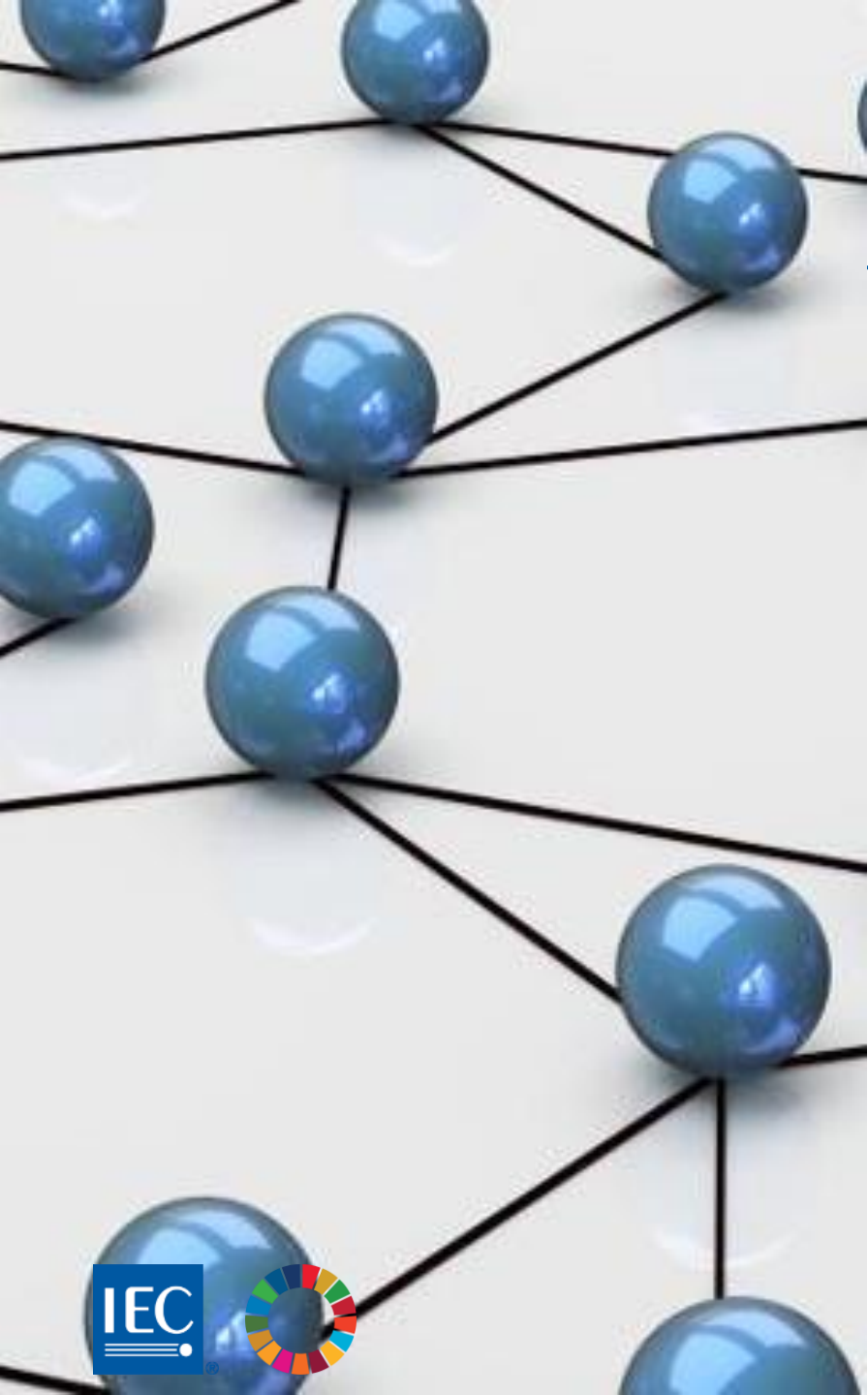
2024-09

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Convener of IEC/TC111/WG15



Policy and strategy background



Carbon neutrality agenda

Countries around world declared their carbon neutrality agenda by means of policies or regulations.

	Carbon Peak	Carbon Neutrality
US	2007	2050
CA	2007	2050
EU	/	2050
DE	1990	2050
FR	1991	2050
GB	1991	2050
JP	2012	2050
KR	2013	2050
CN	2030	2060

Such initiatives arise one key question: **How to quantify the carbon footprint and other environmental impacts in a recognized and consistent way?**

IEC Strategy



Enabling a digital and all-electric society

- 1 Producing standards and conformity assessment solutions for a safe and secure digital society
- 2 Developing and deploying SMART Standards and Conformity Assessment that meet evolving market and member needs
- 3 Strengthening the role of IEC Standards and Conformity Assessment to deliver an all-electric and connected society



Fostering a sustainable world

- 4 Building an efficient, safe and sustainable world through IEC Standards and Conformity Assessment
- 5 Providing solutions and services for net zero, circular economy and sustainable development to meet UN SDGs
- 6 Championing energy efficiency, the renewable energy transition and next generation power systems



Leading on trust, inclusion and collaboration

- 7 Collaborating with partners and stakeholders to enhance sustainable global trade in electrotechnology and increase the use and influence of IEC Standards and Conformity Assessment services
- 8 Embedding good governance and best practices to strengthen organizational excellence and meet stakeholder needs
- 9 Building an inclusive, diverse, innovative and agile organization



How can IEC help

IEC/TC111 Environmental standardization for electrical and electronic products and systems

TC 111 Scope

Standardization of environmental aspects concerns:

- To prepare the necessary guidelines, basic and horizontal standards, including technical reports, in the environmental area, in close cooperation with product committees of IEC, which remain autonomous in dealing with the environmental aspects relevant to their products;
- To liaise with product committees in the elaboration of environmental requirements of product standards in order to foster common technical approaches and solutions for similar problems and thus assure consistency in IEC standards;
- To liaise with ACEA and ISO/TC 207;
- To monitor closely the corresponding regional standardization activities worldwide in order to become a focal point for discussions concerning standardization;
- EMC and EMF aspects are excluded from the scope.



			Description	Publications
ACEA	Basic	Environment	Substances declaration Materials and substances declaration applicable to products and systems	0
			GHG Quantification and communication of greenhouse gases (GHG) from electric and electronic products and systems	0
	Basic	Environment	Assessment Assessments of proportion of recycled, reused and renewable content in electrical and electronic products and system	1
ACEA	Generic	Environment	PCR Common Product Category Rules (PCR) for electrical and electronic products and systems	0



IEC/ACEA (Advisory Committee on Environmental Aspects)

Scope

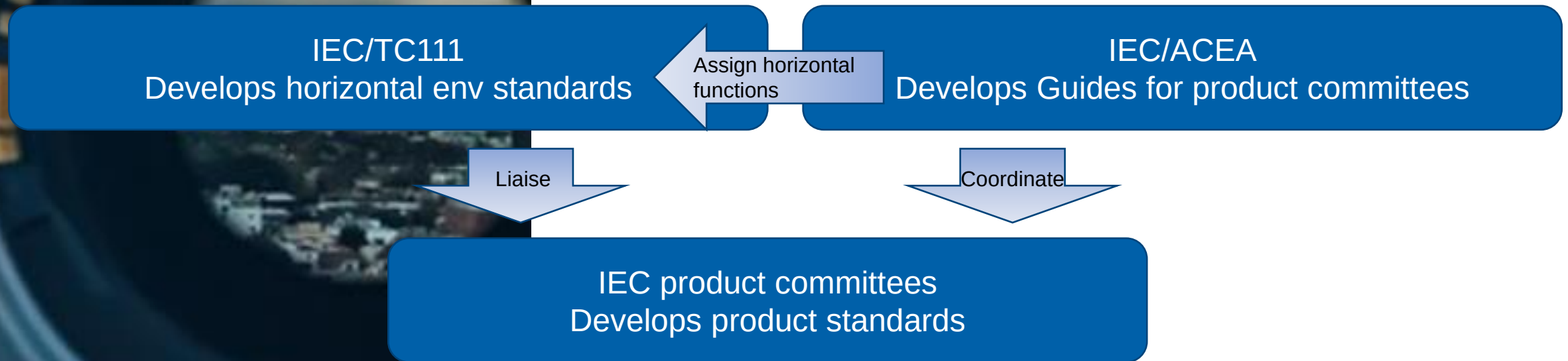
ACEA (Advisory Committee on Environmental Aspects) considers all aspects to improve the environmental performance and to protect the natural environment against detrimental impacts from electrotechnical products and systems.

ACEA

- reports to and advises the SMB (Standardization Management Board) on environmental aspects,
- develops Guides,
- ensures that IEC standards developers take environmental protection concerns into account in their standardization work,
- coordinates IEC work on environmental aspects to ensure consistency in IEC publications, and
- assigns environment horizontal functions to committees, and periodically reviews the assigned environment horizontal functions and associated horizontal publications.

Future Guide on PCR/GHG expected

IEC/TC111 and IEC/ACEA

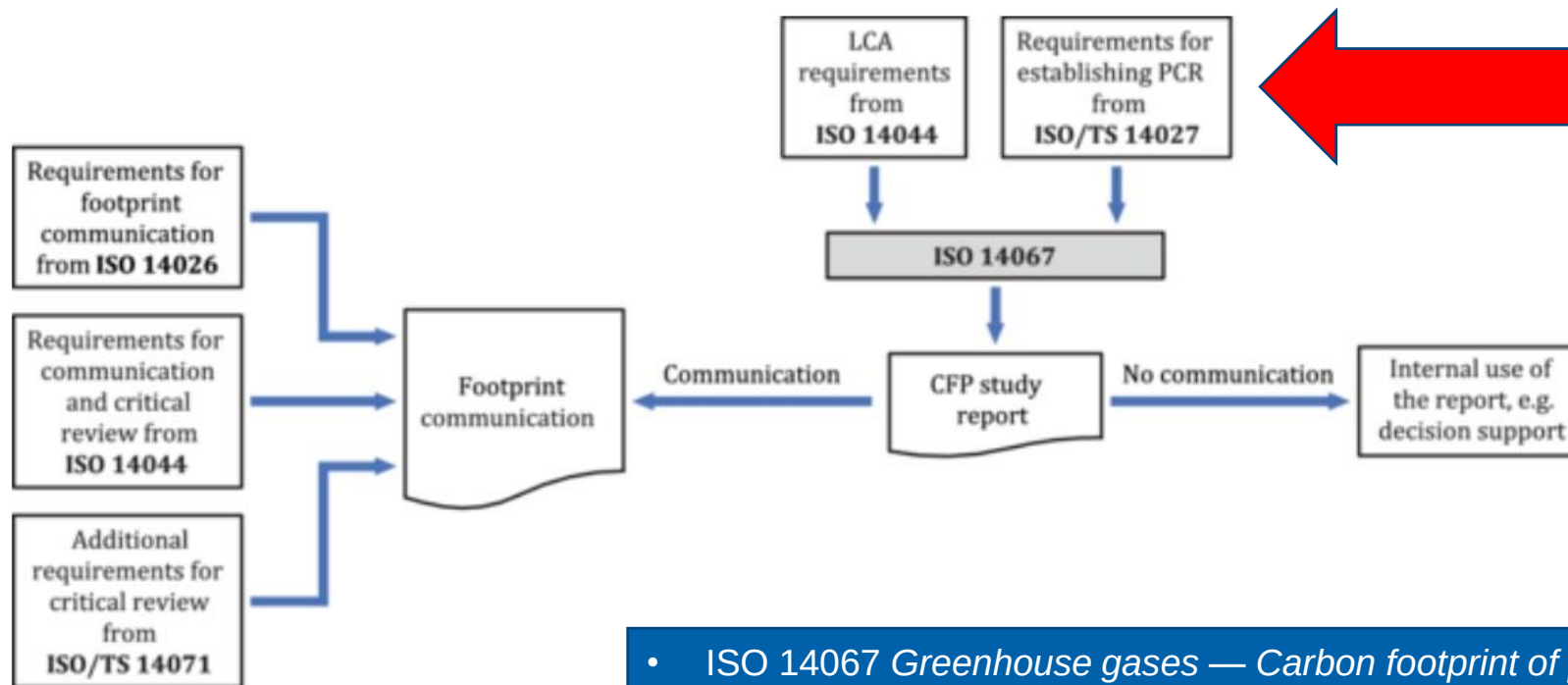




LCA and PCR (Product category rules)

ISO 14067 product GHG quantification

Figure 2 — Relationship between this document and standards beyond the GHG management family of standards



- ISO 14067 *Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification* is based on ISO 14040 and ISO 14044 *Environmental management — Life cycle assessment*.
- The development of product category rules (PCR) is covered in ISO/TS 14027 *Environmental labels and declarations — Development of product category rules*.



Why do we need a PCR

PCR and CFP-PCR

In ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification

3.1.1.9

product category rules

PCR

set of specific rules, requirements and guidelines **for developing Type III environmental declarations and footprint communications** for one or more product categories

3.1.1.10

carbon footprint of a product – product category rules

CFP-PCR

set of specific rules, requirements and guidelines **for CFP or partial CFP quantification and communication** for one or more product categories



Why do we need a PCR

Type III environmental declaration and PCR

In ISO 14025 *Environmental labels and declarations — Type III environmental declarations — Principles and procedures*

3.2

Type III environmental declaration

environmental declaration providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information

Note 1 to entry: The predetermined parameters are based on the **ISO 14040 series of standards, which is made up of ISO 14040 and ISO 14044.**

Note 2 to entry: The additional environmental information may be quantitative or qualitative.

4 Objectives

The objectives of Type III environmental declarations are as follows:

a) to provide **LCA –based** information and additional information on the environmental aspects of products;

Conclusion: Type III environmental declaration provides quantified environmental data by using predetermined parameters based on LCA standards (i.e., ISO 14040 and ISO 14044).



Why do we need a PCR

Type III environmental declaration and PCR

In ISO 14025 *Environmental labels and declarations — Type III environmental declarations — Principles and procedures*

3.5

product category rules

PCR

set of specific rules, requirements and guidelines for developing Type III environmental declarations for **one or more product categories**

3.12

product category

group of products that can fulfil equivalent functions

Why do we need a PCR

Type III environmental declaration and PCR

In ISO 14025 *Environmental labels and declarations — Type III environmental declarations — Principles and procedures*

6.7.1 Developing the contents of a PCR document

The PCR document shall include the following:

- a) product category definition and description;
- b) goal and scope definition for the LCA of the product;
- c) inventory analysis;
- d) impact category selection and calculation rules, if applied;
- e) predetermined parameters for reporting LCA data;
- f) requirements for provision of additional environmental information;
- g) materials and substances to be declared;
- h) instructions for producing the data required to develop the declaration;
- i) instructions on the content and format of the Type III environmental declaration;
- j) information on which stages are not considered;
- k) period of validity.

6.7.2 Requirements for comparability

Comparability of different Type III environmental declaration **shall** be deemed to have been achieved when the following conditions are met:

- a) **Identical** product category definition and description;
- b) **Identical or equivalent** goal and scope definition for the LCA of the product;
- c) **Identical or equivalent** inventory analysis;
- d) **Identical** impact category selection and calculation rules, if applied;
- e) **Identical** predetermined parameters for reporting LCA data;
- f) **Equivalent** requirements for provision of additional environmental information;
- g) **Equivalent** materials and substances to be declared;
- h) **Equivalent** instructions for producing the data required to develop the declaration;
- i) **Equivalent** instructions on the content and format of the Type III environmental declaration;
- j) **Equivalent** information on which stages are not considered;
- k) **Equivalent** period of validity.

Conclusion: PCR is used to achieve comparability of Type III environmental declarations.

Why do we need a PCR

PCR and PSR (Product specific rules)

In ISO/TS 14027:2017 *Environmental labels and declarations — Development of product category rules*

Hierarchical relationships of PCR/PSR are provided in ISO/TS 14027:2017:

If one or more core rules are being used as the basis for the development of the PCR, the PCR shall:

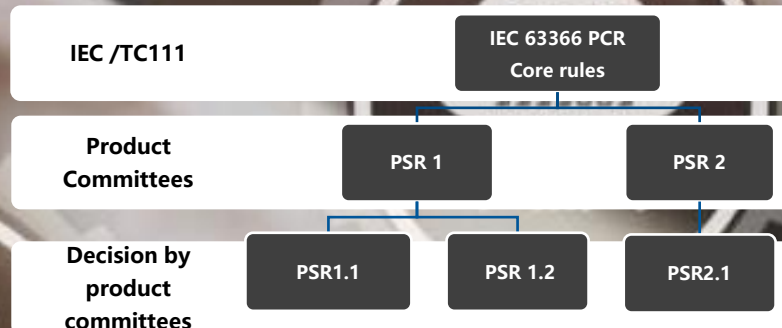
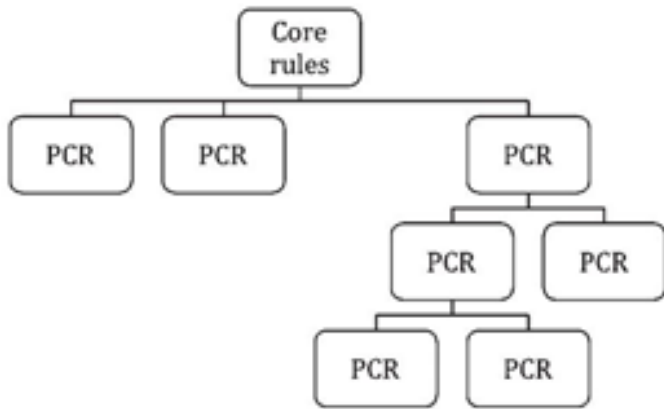
- a) fulfill all the requirements of the core rules;
- b) define its hierarchical position in relation to other PCR that have been developed on the basis of the same core rules within the same programme.

Figure on the left-top shows a graphical representation of a hierarchical structure of PCR published on the basis of the same core rules.

Figure on the left-bottom shows the equivalent relationships of PCR standard and PSR standards in IEC area.

The hierarchical position of PCR within this structure shall indicate conformance to all superordinate documents in the hierarchy.

Conclusion: An IEC PCR standard could help the product committees understand the concept, content and implementation of LCA, it could save expertise, effort and time spent on the development of PSR, and facilitate consistence among PSRs in IEC area.





How to utilize a PCR

IEC 63366 fulfils ISO 14025 & ISO 14027

ISO 14025:2006 clause 6.7.1 PCR content

- **Product category definition and description**
- **Goal and scope definition**
 - Functional unit
 - System boundaries
 - Description of data
 - Criteria for the inclusion of inputs and outputs
 - Data quality requirements
 - Units
- **Inventory analysis**
 - Data collection
 - Calculation procedures
 - Allocation of material and energy flow and releases
- **Impact category selections and calculation rules**
- **Predetermined parameters for reporting LCA data**
- **Requirements for provision of additional environmental information**
- **Materials and substances to be declared**
- **Instructions for producing the data required to develop the declaration**
- **Instructions on the content and format of the Type III environmental declaration**
- **Information on which stages are not considered**
- **Period of validity**

IEC/TC111 IEC 63366 PCR for EEPS

- **Product category (EEPS)**
- **Product LCA**
 - PCR
 - Functional unit and reference flow description
 - System boundary;
 - Life cycle inventory;
 - Allocation rules;
 - Units;
 - Data quality;
 - Development of scenarios
 - Life cycle impact assessment
 - Additional rules
 - LCA report
- **Requirements for the development of PSR for EEPS**

ISO TS 14027:2017 clause 6.5 PCR content

- **Product category description**
- **Functional unit / declared unit**
- **Requirements for conducting the underlying LCA or footprint studies**
 - Functional or declared unit;
 - System boundary;
 - Specific data or calculation rules;
 - Allocation rules;
 - Product lifetime.
- **Predetermined parameters**
 - Impact category indicator results;
 - Inventory results that are elementary flows;
 - Data that don't represent elementary flows.
- **Core rules**
- **Conditions to support comparability**
- **Additional environmental information**

- ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedures
- ISO/TS 14027:2017 Environmental labels and declarations — Development of product category rules
- IEC 63366 Product category rules for life cycle assessment of electrical and electronic products and systems.

How to utilize IEC 63366 as a "template"

IEC/TC111 IEC 63366 PCR for EEPS

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IEC/TC product IEC PSR for Specific product category

- **Product category**
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- **Who is responsible for PSR development?**
- PSR **shall** be developed by dedicated (product-related, vertical) technical committees corresponding to their scope.
- **In what manner PSR shall be developed?**
- PSR development **shall** be conducted in accordance with the requirements set out in IEC 63366 as well as the provisions of ISO/TS 14027.
- PSR **should** be more specific than the general PCR.
- **What is the core content of PSR?**
- The core of PSR is to define the **default scenarios and relevant parameters** to be applied in the LCA. The provisions of PSR **shall** reflect expert knowledge and **should** be based on specific case studies to validate the defined default scenario and parameters set.

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How to ensure consistency with PCR and avoid overlapping?

Each PSR **shall**:

- Clearly define the product group or product groups covered by the PSR;
- Indicate the paragraph of the PCR to which the additional requirements refer to; For each of the product families covered, indicate at least the additional requirements for:
 - a) The functional unit;
 - b) The reference service life;
 - c) The use scenario;
 - d) The EoL treatment scenario;
 - e) The reference flow elements to consider in the LCA or that can be ignored;
 - f) The list of impact categories and category indicators to consider in the LCA or that can be ignored;
 - g) The allocation rule for recovery operations.

How to utilize IEC 63366 as a "template"

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- The PCR **should** be complemented with corresponding PSR to further specify assumptions and methodology to be used for specific product families.
- PSR **shall** be developed in the respective product technical committees according to the requirements set out in IEC 63366.

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- In PSR development it **shall** be taken into account that the definition of the RSL could lead to distortions for product groups with a considerable range of product life span between products of their usage scenarios.
- Each functional unit **shall** be further specified in PSR for each product or system family to improve comparison between assessment results.
- Since this reference flow is very product (system) specific it **shall** be described in detail in PSR.
- If relevant, the declared unit **shall** be specified further in the corresponding PSR.

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Further(than general) specifications concerning the system boundary **shall** be defined in the PSR.

Details concerning cut-off criteria **may** be developed, defined and justified in PSR.

These PSR **may** address cut-off by defining criteria for mass and energy cut-off, and / or main (and auxiliary) products parts, which are mandatory for the life cycle assessment. Therefore, PSR **can** be stricter and more specific in that context. Any exclusion of inputs and outputs **shall** be documented and justified.

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- The relevance of life cycle stages and their underlying processes itself **shall** be defined further in corresponding PSR.
- This (installation and de-installation) stage shall be considered separately only when a specific installation process is defined for the respective product or corresponding regulatory requirements exist. This **should** be defined in PSR.

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- The allocation rule for co-products **should** be defined further in PSRs, in accordance with allocation principles defined in ISO 14044:2006 principles.
- The allocation rule for recovery operations **should** be defined further in PSRs, in accordance with allocation principles defined in ISO 14044:2006.

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Selection of primary data sources, specific data, average data, or generic data **should** be detailed further in PSR.

How to utilize IEC 63366 as a "template"

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- Selection of primary data sources, specific data, average data, or generic data **should** be detailed further in PSR.
- The (transportation) scenario **should** be detailed in a PSR.
- Use scenarios **shall** be specified in PSRs as they are very product specific.
- EoL scenario **should** be defined further in PSR since it is very product (system)-specific. The PSR **shall** detail and document which processes are relevant for the product category, i.e. applied at the end of life stage.

How to utilize IEC 63366 as a "template"

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Extrapolation rules **may** be already set in the PSRs. In this case they can be directly applied. These rules are set based on different products LCA and justified and documented in the PSR.

How to utilize IEC 63366 as a "template"

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 - **LCA report**

The LCA report **shall** include if applicable, the reference to the relevant PSR, category of product in terms of PSR, where applicable .

How to use IEC 63366 and PSRs

- ISO 14040 & ISO 14044 can directly be applied for LCA
- IEC 63366 (PCR) could be applied with ISO 14040 & ISO 14044, **when there is no PSR standard available**. Recorded complementary specifications need to be done.
- A PSR standard could be applied with ISO 14040 & ISO 14044.
 - Preparing of PSR standard **shall use IEC 63366 as a starting point**.
 - PSR standard **take precedence over requirements in IEC 63366**.
- Environmental declarations can be compared, **ONLY** when it fulfills the requirement in 6.7.2 of ISO 14025.



Current progress of IEC 63366



Current progress of IEC 63366

Key facts and figures:

IEC/TC111/WG15 is consisted by **62** experts from **16** NCs

(data: 2024-9)

Progress of the work:

NP stage: 2020-10 to 2021-01, 111/598/NP

CD stage: 2021-11 to 2022-02, 111/646/CD

CDV stage: 2023-03 to 2024-09, 111/691/CDV, and DC document circulated to product TCs for consultation

Current situation: **submitted for FDIS**

Current progress of IEC 63366

- Users of the standard:
 - ✓ IEC product TC/SCs
 - ✓ LCA professional or practitioners in EEPS area
- Horizontal function status:

According to initial discussion with ACEA chair and TC111/CAG, this standard will be a **generic horizontal publication** (category) and **essential horizontal publication** (type)

This is already approved by IEC/SMB.

Thank you